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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,894	07/09/2003	Takeshi Ootsuka	P/2850-80	9850

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OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER	
DHINGRA, RAKESH KUMAR	
ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,894	OOTSUKA, TAKESHI	
	Examiner	Art Unit	
	Rakesh K. Dhingra	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2006*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 2* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01/06, 06/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

The terminal disclaimer filed on 6/29/06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of application number 10/613,574 (Ootsuka et al) and patent numbers 6,872,908 & 6,768,079 has been reviewed and is accepted. The terminal disclaimer has been recorded. Accordingly double patenting rejection is withdrawn.

Response to Arguments

Applicant's arguments filed 6/29/06 have been fully considered but they are not persuasive as explained hereunder.

Applicant has amended independent claims 1 and 2 by adding limitations of claim 3. Applicant argues that 1) Chiang does not disclose material for forming power supplying terminal and the material for forming an insulation layer, 2) that Arami does not disclose material for forming power supplying terminal and discloses the material for forming an insulation layer as P-BN, SiO2 etc, 3) that Yamaguchi does not disclose material for forming power supplying terminal, 4) that as per Inazumachi, thermal coefficients of susceptor and power supplying terminal are regulated by controlling their respective mixing ratios of their materials, and 5) that as per Yamamoto's teachings, conductive aluminum nitride –tantalum nitride sintered member can not be obtained since tantalum nitride is disclosed as a suitable conductive material.

Examiner responds that as per amended claims 1 and 2, Chiang et al discloses claim limitations interalia, susceptor base body 6 with inner electrodes 80, 82 and power supplying terminals 318 (second terminal not shown in Figure 27A).
Further, Arami discloses that material of insulating layer 27 can be boron nitride (as per claim limitation). Additionally, Yamaguchi teaches material for susceptor base body to be aluminum nitride based sintered body as per claim limitations.
Lastly, Inazumachi and Yamamoto teach that power supplying terminal can be formed from aluminum nitride-tantalum nitride sintered member, as per claim limitations. Thus Chiang, Arami, Yamguchi, Inazumachi and Yamamoto when combined teach all limitations of amended claims 1 and 2. Accordingly amended claims 1 and 2 have been rejected under 35 USC 103 (a) as explained below. Further, amended claims 1 and 2 have also been rejected under 35 USC 103 (a) in view of admitted prior art, Arami, Inazumachi and Yamamoto as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al (US PGPUB No. 2005/0051100) in view of Arami et al (US Patent No. 5,591,

269), Yamaguchi (US Patent No. 6,645,304), Inazumachi et al (US Patent No. 6,693,789) and Yamamoto et al (US Patent No. 6,475,924).

Regarding Claim 1: Chiang et al teach an electrode-built-in susceptor (Figures 1, 6-8, 27-31) comprising:

An electrostatic chuck (susceptor base body) 6 made of aluminum-nitride having a surface for carrying a plate substrate (sample) 8 thereon,

inner electrodes 80, 82 that are built in the susceptor base body 6;

a power supplying terminal 318 (Figure 27A), disposed in the susceptor base body and contacting the inner electrode 80 (Paragraphs 0073, 0088-0091, 0157-0160).

Chiang et al do not teach insulating layer formed by boron nitride etc, susceptor body made of aluminum nitride –group-sintered-member and the power supplying terminal made from conductive aluminum nitride – tantalum nitride composite sintered member.

Arami et al teach a mounting table (electrode built-in susceptor) 21 [Figures 1-3] that includes a base (susceptor base body) 22 on which one of which surface a wafer (sample) W is mounted, conductive members (inner electrodes) 24, 25 that are built in the mounting table assembly 15 and connected to separate DC power supplies and an insulating layer 27 which is formed by a thin film of boron nitride or aluminum oxide between the inner electrodes 25, 26 and the mounting surface (Column 8, lines 20-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use insulating layer made from boron nitride and disposed between inner electrodes and mounting surface as taught by Arami et al in the apparatus of Chiang et al to obtain electrostatic chucking means (Column 3, lines 5-15).

Chiang et al in view of Arami et al do not teach susceptor body made of aluminum nitride –group-sintered-member and the power supplying terminal made from conductive aluminum nitride – tantalum nitride composite sintered member.

Yamaguchi teaches a susceptor assembly (Figure 1) that includes a susceptor body 1 comprising of supporting layer 2 and surface layer 3, that is made from aluminum nitride –based sintered body (column 4, line 10 to column 5, line 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use susceptor made from aluminum nitride –based sintered body as taught by Yamaguchi in the apparatus of Chiang et al in view of Arami et al to prevent positional deviation of wafer during hot processing (Column 1, lines 30-35).

Chiang et al in view of Arami et al and Yamaguchi do not teach the power supplying terminal made from conductive aluminum nitride – tantalum nitride composite sintered member.

Inazumachi et al teach an apparatus (Figure 2) that includes susceptor 5 having an internal electrode 2 which is supplied power through terminals 4, and which terminals are made from conductive aluminum nitride – tantalum composite sintered member (Column 4, lines 40-50, Column 9, lines 25-35 and Claim 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use power supply terminals made from conductive aluminum nitride – tantalum composite sintered member as taught by Inazumachi et al in the apparatus of Chiang et al in view of Arami et al and Yamaguchi to select desired specific resistance of internal electrode (Column 4, lines 40-55).

Chiang et al in view of Arami et al, Yamaguchi and Inazumachi et al teach all limitations of the claim including power supplying terminal made from aluminum nitride-tantalum powder sintered member but do not expressely teach that the tantalum used in the sintered composite is tantalum nitride.

Yamamoto et al teach (Figure 1) that for sintered aluminum nitride substrates, tantalum nitride can be used to provide electrical conductive layer with good adhesion with the aluminum nitride substrates (Column 4, lines 15-30). Furthermore during sintering process some of the tantalum will be inherently converted to tantalum nitride through reaction with nitride present in the mixture.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to form the terminal formed from tantalum nitride and aluminum nitride sintered member as taught by Yamamoto et al in the apparatus of Chiang et al in view of Arami et al, Yamaguchi and Inazumachi et al to provide electrically conductive layer with high adhesive strength between aluminum nitride and tantalum nitride.

Regarding Claim 2: Chiang et al in view of Arami et al, Yamaguchi, Inazumachi et al and Yamamoto et al teach all limitations of the claim as explained above including plurality of inner electrodes 80, 82 and plurality of power supplying terminals 318 (second terminal not shown in drawing) [Chiang et al – paragraph 0158]. Chiang et al in view of Arami et al, Yamaguchi, Inazumachi et al and Yamamoto et al also teach that insulating layer 27 is disposed between a pair of adjacent inner electrodes 24, 25 (Arami et al - Figure 2).

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in view of Arami et al (US Patent No. 5,591, 269), Inazumachi et al (US Patent No. 6,693,789) and Yamamoto et al (US Patent No. 6,475,924).

Regarding Claim 1: Admitted prior art teach an electrode-built-in susceptor (Figure 6) comprising:

an electrostatic chuck (susceptor base body) 1 made of an aluminum-nitride group sintered member having a surface for carrying a plate sample 2a thereon;

inner electrodes 4 built in the susceptor base body 1;

power supplying terminals 6, disposed in the susceptor base body so as to be attached to the inner electrodes 4 (Page 2).

Admitted prior art does not teach insulating layer of boron nitride etc and the power supplying terminal made from conductive aluminum nitride – tantalum nitride composite sintered member.

Arami et al teach a mounting table (electrode built-in susceptor) 21 [Figures 1-3] that includes a base (susceptor base body) 22 on which one of which surface a wafer (sample) W is mounted, conductive members (inner electrodes) 24, 25 that are built in the mounting table assembly 15 and connected to separate DC power supplies and an insulating layer 27 which is formed by a thin film of boron nitride or aluminum oxide between the inner electrodes 25, 26 and the mounting surface (Column 8, lines 20-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use insulating layer of boron nitride between electrodes and mounting surface as

taught by Arami et al in the apparatus of admitted prior art to obtain electrostatic chucking means (Column 3, lines 5-15).

Admitted prior art in view of Arami et al do not teach the power supplying terminal made from conductive aluminum nitride – tantalum nitride composite sintered member.

Inazumachi et al teach an apparatus (Figure 2) that includes susceptor 5 having an internal electrode 2 which is supplied power through terminals 4, and which terminals are made from conductive aluminum nitride – tantalum composite sintered member (Column 4, lines 40-50, Column 9, lines 25-35 and Claim 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use power supply terminals made from conductive aluminum nitride – tantalum composite sintered member as taught by Inazumachi et al in the apparatus of admitted prior art in view of Arami et al to select desired specific resistance of internal electrode (Column 4, lines 40-55).

Admitted prior art in view of Arami et al and Inazumachi et al teach all limitations of the claim including power supplying terminal made from aluminum nitride-tantalum powder sintered member but do not expressely teach that the tantalum used in the sintered composite is tantalum nitride.

Yamamoto et al teach (Figure 1) that for sintered aluminum nitride substrates, tantalum nitride can be used to provide electrical conductive layer with good adhesion with the aluminum nitride substrates (Column 4, lines 15-30). Furthermore during sintering process some of the tantalum will be inherently converted to tantalum nitride through reaction with nitride present in the mixture.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to form the terminal formed from tantalum nitride and aluminum nitride sintered member as taught by Yamamoto et al in the apparatus of admitted prior art in view of Arami et al, Yamaguchi and Inazumachi et al to provide electrically conductive layer with high adhesive strength between aluminum nitride and tantalum nitrideRegarding Claim 2: Admitted prior art in view of Arami et al, Inazumachi et al and Yamamoto et al teach all limitations of the claim as explained above including plurality of inner electrodes 4 and plurality of power supplying terminals 6 (shown in drawing) [admitted prior art – Figure 6]. Admitted prior art in view of Arami et al, Inazumachi et al and Yamamoto et al also teach that insulating layer 26 is disposed between pair of adjacent inner electrodes 24, 25 (Arami et al – Figure 2).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rakesh Dhingra

Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763